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Research Article

Camellia shuangbaiensis (Theaceae), a new species from Yunnan, China

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Abstract

A new species of the genus *Camellia* (Theaceae), *Camellia shuangbaiensis* G.P.Yang & B.H.Wu, **sp. nov.**, from the central region of Yunnan Province of China is described. *Camellia shuangbaiensis* is morphologically similar to *C. mileensis* and *C. hongkongensis*, but it can be distinguished by its smaller leaves with an ovate, abaxially tomentose lamina, and 14–16 bracteoles and sepals.

Key words: *Camellia*, Flora, new taxon, Shuangbai County, taxonomy

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Introduction

Camellia Linnaeus (1753: 698) (Theaceae) is a genus of evergreen trees or shrubs predominantly distributed across the tropical and subtropical regions of Asia (Chang and Ren 1998; Ming and Bartholomew 2007). Renowned for their ornamental value and economic importance, particularly in tea production, *Camellia* species have been cultivated for a long history in China, and China harbors the richest diversity of *Camellia*, with over 80% of the recorded species within its region (Chang and Ren 1998; Ming and Bartholomew 2007). From 2020 to 2025, there were 8 new *Camellia* species described from China (Liu et al. 2020a, 2020b; Xu et al. 2020; Yu et al. 2021; Ye et al. 2022; Zhang et al. 2022; Chen et al. 2023; Lin et al. 2024). Moreover, a study using floral pigments and multivariate analyses suggested that the Xinan District in China, encompassing Yunnan province, is presumed to be the origin site of red-flowered *Camellia* species (Li et al. 2013).

During our field investigations in Yunnan Province in 2024, we found an unknown *Camellia* species with red flowers with 3 distinct styles and brown fruits

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with furfuraceous surfaces. Through extensive morphological comparisons and taxonomic analyses, we have confirmed that these specimens represent a new species, which we formally describe in this document.

Materials and methods

Morphological comparisons of the putative new species with related species were conducted using living plants, relevant literature, and herbarium specimens. Measurements were conducted manually with rulers or using Digimizer version 4.6.0 (MedCalc Software, Mariakerke, Belgium). The voucher specimens were deposited in the herbarium of China National Botanical Garden (**CNBG**), the herbarium of South China Botanical Garden (**IBSC**) and the herbarium of Sun Yat-sen University (**SYS**).

Results

Taxonomic treatment

Camellia shuangbaiensis **G.P.Yang & B.H.Wu, sp. nov.**
urn:lsid:ipni.org:names:77359329-1
Fig. 1
Chinese name: 双柏山茶 (Shuang Bai Shan Cha)

Type. **China** • **Yunnan:** Shuangbai County, Damaidi Township, in ravine. 24°22.44'N, 101°50.84'E, 1740.262051 m a.s.l., 6 June 2024 (fl.), *S. Qu and G.P. Yang Lg2024132* (holotype: CNGB!; isotypes: IBSC!).

Diagnosis. *Camellia shuangbaiensis* morphologically resembles *C. mileensis* T.L.Ming and *C. hongkongensis* Seem., but it can be distinguished from the latter two species by its leaves with ovate shape, tomentose abaxial surface and rounded leaf base and bracteoles/sepals 14–16.

Description. Small evergreen tree, 2–4 m tall; bark greyish brown, rough; current-year branchlets densely covered with whitish pubescence. Leaf blades ovate to elliptic, leaf apex acuminate to acute, leaf base round, 3.5–6.5 × 2.3–4 cm, leaf blade leathery, adaxially dark green, pubescent along the midrib, abaxially light green, tomentose, more or less punctate; midrib prominent on both surfaces, secondary veins 5–6 pairs, elevated on adaxial surface and impressed on abaxial surface; petiole 2–5 mm long, pubescent. Flowers solitary or sometimes 2 or 3-clustered, terminal, subterminal or axillary, 2–4 cm in diameter, sessile. Bracteoles and sepals 14–16, semipersistent, outside brownish silky pubescent, inside glabrous; outer bracteoles and sepals broadly semiorbicular, rarely apex bifid; inner bracteoles and sepals suborbicular to oblong-elliptic. Petals 6–7, red, basally slightly connate, oblong-elliptic to obovate-elliptic, apex round, 7–11 × 4–5 mm, outside white silky pubescent along ridge. Stamens 33–40, 1.5–2.8 cm long, glabrous; outer filament whorl basally connate for 1–1.5 cm. Ovary 3-loculed, about 2.5–3.3 mm in diameter, tomentose. Styles 3, distinct, glabrous, 1.4–1.75 cm long. Capsule ovoid or subglobose, surface furfuraceous, 1.7–1.9 cm in diameter; pericarp ca. 2 mm thick.

Phenology. Flowering in February, fruiting in June.

Etymology. The specific epithet "shuangbaiensis" refers to Shuangbai County of Yunnan Province, the type locality of the new species.

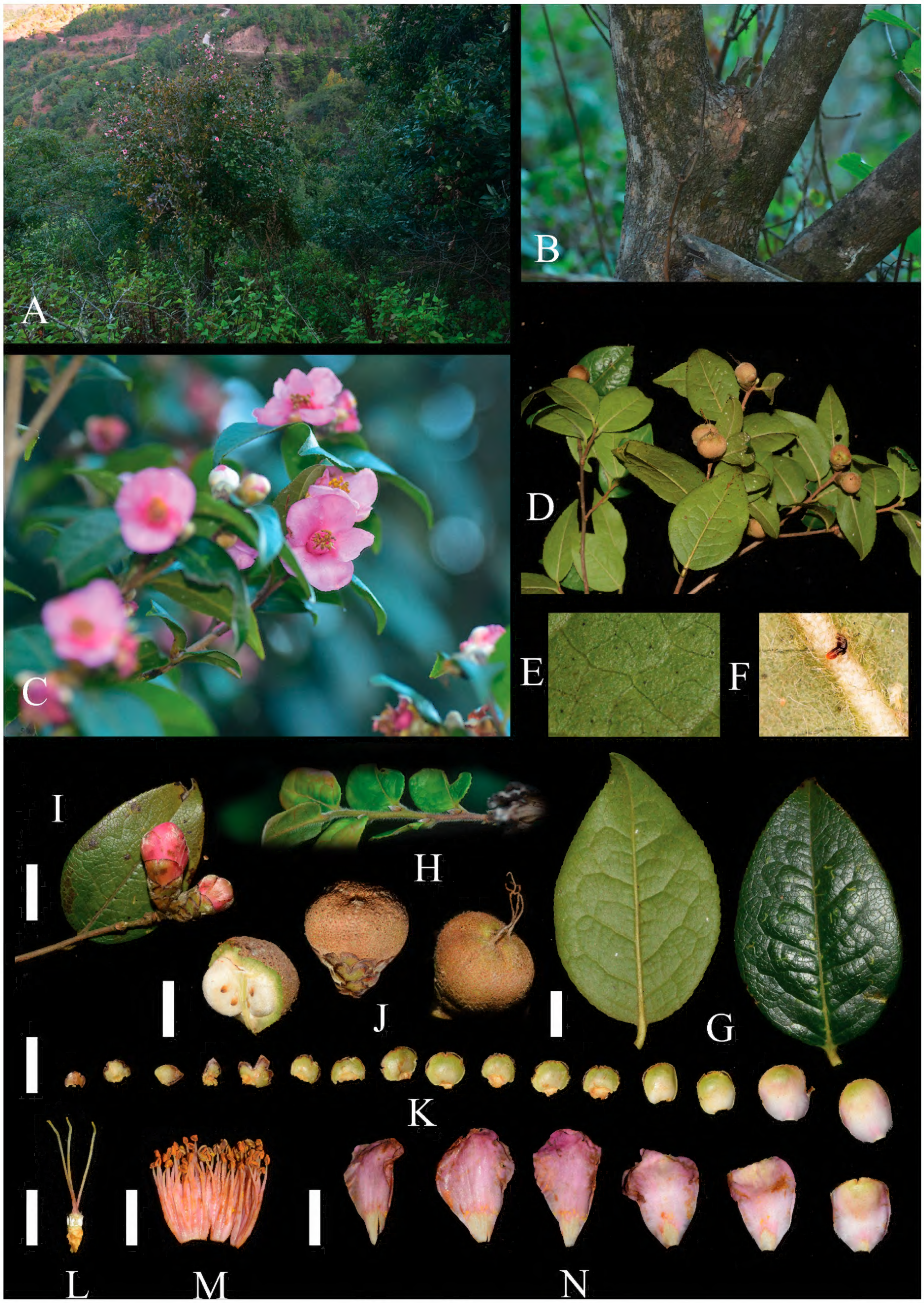

Figure 1. *Camellia shuangbaiensis* **A** flowering individual and habitat **B** stem **C** flowering branch **D** fruiting branches **E** tomentose and punctate leaf abaxial surface **F** pubescent midvein on the leaf abaxial surface **G** leaves **H** branchlet **I** flower buds **J** fruits **K** bracteoles and sepals **L** pistil **M** androecium **N** petals. Photographed by Shang Qu and Bao-Huan Wu. Scale bars: 1 cm.

Distribution and habitat. Presently, *Camellia shuangbaiensis* is only known from its type locality, Shuangbai County of central Yunnan. It is distributed in mountain slope mixed forest habitat at altitudes of 1500–2000 m a.s.l.

Additional specimens examined. CHINA • Yunnan: Shuangbai County, Damaidi Town, Damaidi Country, 24°22.44'N, 101°50.84'E, 1740 m a.s.l., 5 February. 2024 (fl.), *S. Qu and G.P. Yang Lg2024133* (CNGB; SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024135* (SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024136* (SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024137* (SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024138* (SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024139* (SYS); • ibid., 11 June 2024 (young fr.), *S. Qu and F.F. Li Lg2024140* (SYS).

Discussion

Morphologically, *Camellia shuangbaiensis* closely resembles *C. mileensis* and *C. hongkongensis*. However, it can be distinguished by its ovate leaves with tomentose adaxial surface, rounded leaf bases, and 14–16 bracteoles/sepals. Detailed morphological comparisons among *C. shuangbaiensis* and its relatives are presented in Table 1.

Section *Furfuracea* was initially circumscribed based on *C. furfuracea* (Merr.) Cohen-Stuart (Chang 1981), and primarily characterized by its furfuraceous (scaly) fruit surface. Ming (1999, 2000) merged this section into Sect. *Heterogenea*, however, molecular phylogenetic analyses (Xiao and Parks 2003; Vijayan et al. 2009; Zhao et al. 2023) have consistently rejected this taxonomic treatment, and a broader sect. *Furfuracea* including *C. hongkongensis* was supported.

Table 1. Morphological comparison of *Camellia shuangbaiensis* and similar species.

Characters	*Camellia shuangbaiensis*	*C. mileensis*	*C. hongkongensis*
Habit	small trees, 2–4 m tall	shrubs to 2 m tall	trees to 10 m tall
Leaf blade	ovate to elliptic, abaxially tomentose, more or less punctate, pubescent along midvein, adaxially pubescent along midvein	elliptic, oblong, or lanceolate, abaxially sparsely villous along midvein, punctate, adaxially glabrous	oblong, oblong–elliptic, or oblong–lanceolate, both surfaces glabrous
Leaf length	3.5–6.5 cm	6–6.5 cm	6–12.5 cm
Leaf width	2.5–4 cm	2.5–3 cm	2–4 cm
Petioles	3–5 mm,pubescent	3–5 mm,hirtellous	7–13 mm, glabrous
Leaf margin	crenate–serrulate	serrulate	entire or obscurely undulate–denticulate
Leaf apex	acuminate to acute	bluntly and shortly caudate	acuminate to shortly acuminate
Leaf base	Rounded	cuneate to broadly cuneate	cuneate to obtuse
Bracteoles and sepals	14–16,semipersistent	9–10,semipersistent	11–12,semipersistent
Petals	6–7, red, obovate to broadly obovate, 1.2–1.9 × 1.4–3.5 cm	7–8, white or pale pink, obovate, 2–2.5 × 1.4–1.8 cm	6–7, red, broadly obovate, 3–3.5 × 1.5–2.3 cm
Stamens	filament whorl 1.5–2.8 cm,outer filament whorl basally connate for 1–1.5 cm	filament whorl 1.8 cm, outer filament whorl basally connate for 0.9–1.4 cm	filament whorl 2.5–3 cm,outer filament whorl basally connate for 1.3–2 cm
Styles	3, distinct, 1.3–1.7 cm	3,distinct, ca. 1.7 cm	3,distinct,2.8–3.3 cm
Ovaries	2.5–3 mm in diam., densely white tomentose	1.5 mm in diam., white tomentose,	ca. 2 mm in diam., densely tomentose
Fruit	1.7–2 cm in diam., furfuraceous, pericarp ca. 2 mm thick	1.2–1.5 cm in diam., furfuraceous, pericarp ca. 1.5 mm thick	2–3 cm in diam., furfuraceous, pericarp 3–4 mm thick

Both *C. hongkongensis* and *C. shuangbaiensis* align with Sect. *Furfuracea* species in terms of their furfuraceous fruit surfaces and 3 free styles. However, their red petals clearly distinguish them from the species of Sect. *Furfuracea*.

Although *C. hongkongensis* was previously classified under Sect. *Camellia* (Chang 1981; Chang and Ren 1998; Ming et al. 2000; Ming and Bartholomew 2007), recent molecular studies (Xiao and Parks 2003; Vijayan et al. 2009; Zhao et al. 2023) have supported to place it within Sect. *Furfuracea*. Considering the morphological similarities between the two species, *C. shuangbaiensis* is likely also a member of Sect. *Furfuracea*.

Camellia shuangbaiensis is currently found only in the Damaidi Township, where it grows along the edges of dry-hot river valleys. With a population of just over 100 individuals, the species is restricted to areas adjacent to roadsides, which are heavily impacted by human activities. Additionally, some individuals have been observed to be parasitized by *Scurrula* species. Considering its restricted distribution and vulnerability to parasitic plants and invasive species, *C. shuangbaiensis* faces severe survival threats, which are further exacerbated by its proximity to vehicular pathways on mountain slopes.

These factors necessitate urgent and comprehensive conservation measures. Despite these challenges, the species' striking floral characteristics render it a promising candidate for ornamental camellia breeding programs, highlighting the importance of implementing targeted ecological management strategies to ensure its long-term survival in situ.

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

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Author contributions

Zi-Yuan Li and Bao-Huan Wu are the main authors of the article, and everyone else participated in the writing. Shang Qu, Le-Shan Du, Hai-Ou Liu, He-Xiang Duan, Fei-Fei Li and Wen-Hui Liu participated in the taxonomic confirmation of the new species and field investigation, and Fei-Fei Li and Wen-Hui Liu are the leaders of the research projects, responsible for promoting the project.

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Data availability

All of the data that support the findings of this study are available in the main text.

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